

CLAIMS

What is claimed is:

1. An apparatus to feed a plurality of papers in an image forming device, comprising:
  - a feeding stand to receive the plurality of papers;
  - a separating guide provided to the feeding stand, with which front ends of the plurality of papers makes contact;
  - a main pickup roller provided to make contact with an uppermost layer of the plurality of papers in an upper part of the feeding stand to separately transfer the plurality of papers towards the separating guide; and
  - an auxiliary pickup roller to apply a predetermined pressure to each of the plurality of papers upon transfer of the plurality of papers via the main pickup roller.
2. The apparatus according to claim 1, wherein a vertical pressure application force including weight of the auxiliary pickup roller is set larger than a buckling force of each of the plurality of papers to induce buckling between the auxiliary pickup roller and the separating guide by a front end resistance force of the separating guide; and
  - pickup by slipping against the separating guide is generated at a front end of each of the plurality of papers so that the auxiliary pickup roller is raised up based on a type of the plurality of papers.
3. The apparatus according to claim 2, further comprising:
  - a pickup bracket having the main pickup roller installed at one end;
  - a gear train provided inside the pickup bracket to transfer external power to the main pickup roller; and
  - at least one supporting plate to rotatably connect the auxiliary pickup roller to an axis of the main pickup roller.
4. The apparatus according to claim 2, wherein distance between the auxiliary pickup roller and the separating guide is within a range of 10~35mm.

5. The apparatus according to claim 2, wherein the vertical pressure application force of the auxiliary pickup roller is within a range of 30~70gf.

6. The apparatus according to claim 2, wherein the auxiliary pickup roller further comprises:

a friction member having more than a predetermined frictional force provided to a surface of the auxiliary pickup roller.

7. The apparatus according to claim 2, wherein the auxiliary pickup roller is installed to run idle and rotates when each of the plurality of papers is transferred.

8. The apparatus according to claim 2, wherein the auxiliary pickup roller operates with the same linear velocity as the main pickup roller.

9. The apparatus according to claim 2, further comprising:  
at least two auxiliary pickup rollers.

10. The apparatus according to claim 2, further comprising:  
a combination of a plurality of divided roller members are provided as the auxiliary pickup roller.

11. The apparatus according to claim 2, further comprising:  
a pressure applying unit to generate, and to maintain the vertical pressure application force of the auxiliary pickup roller.

12. The apparatus according to claim 11, wherein the pressure applying unit comprises:  
an elastic member to apply pressure on the supporting plate, wherein the pressure applying unit is supported via the pickup bracket at one end and the pressure applying unit is supported via the supporting plate at another end.

13. The apparatus according to claim 12, wherein the elastic member comprises:  
one of a torsion spring, a coil spring, and a plate spring.

14. The apparatus according to claim 3, further comprising:

an exciting unit to prevent overlapped transfer of the plurality of papers.

15. The apparatus according to claim 14, wherein the exciting unit comprises:

at least one cam member eccentrically connected to an axis projected from an arbitrary gear of the gear train to transfer power to the main pickup roller, and to generate vibration using a disproportion of mass due to rotation of the cam member.

16. The apparatus according to claim 14, wherein the exciting unit comprises:

a vibration member.

17. An apparatus to feed a plurality of papers in an image forming device, comprising:

a feeding stand to receive the plurality of papers;

a separating guide provided to the feeding stand at an incline having a predetermined angle with which a front end of the plurality of papers makes contact;

a main pickup roller installed to make contact with an uppermost layer of the plurality of papers in an upper part of the feeding stand, to transfer the plurality of papers towards the separating guide using frictional force generated by rotational contact with the plurality of papers; and

an auxiliary pickup roller positioned between the main pickup roller and the separating guide, to apply a predetermined pressure on the plurality of papers upon transfer of the plurality of papers via the main pickup roller, where the main pickup roller is of a cam structure having an eccentric axis, and picks up a paper in an impact manner by generating vibration upon a rotation thereof.

18. The apparatus according to claim 17, wherein a vertical pressure application force including weight of the auxiliary pickup roller is set larger than buckling force of a paper having a first thickness, to induce buckling between the auxiliary pickup roller and the separating guide by front end resisting force due to the separating guide so that the paper is picked up, while in case of a paper having a second thickness greater than the first thickness, pickup by slipping against the separating guide is generated at a front end of the paper having the second thickness so that the auxiliary pickup roller is raised up.

19. The apparatus according to claim 18, further comprising:  
a pair of idle rollers installed in the eccentric axis, to prevent vibration occurring upon impact-picking of a paper by the cam typed main pickup roller.
20. The apparatus according to claim 19, wherein the pair of idle rollers comprise:  
a friction member having a surface with predetermined frictional force.
21. An apparatus to feed paper in an image forming device, comprising:  
a feeding stand to receive a plurality of papers;  
a separating guide provided to the feeding stand inclined at a predetermined angle with which a front end of the plurality of papers makes contact;  
a main pickup roller to transfer the plurality of papers towards the separating guide using a frictional force generated by rotational contact with the plurality of papers;  
an auxiliary pickup roller to apply a predetermined pressure on the plurality of papers upon transfer of the plurality of papers via the main pickup roller; and  
an exciting unit to prevent overlapped transfer of the plurality of papers by providing vibration to the plurality of papers.
22. The apparatus according to claim 1, wherein an operating torque is uniformly controlled.
23. The apparatus according to claim 21, wherein a vertical application force including weight of the auxiliary pickup roller is set larger than a buckling force of each of the plurality of papers to induce buckling between the auxiliary pickup roller and the separating guide by front end resistance force of the separating guide.
24. The apparatus according to claim 21, wherein pickup by slipping against the separating guide is generated at a front end of each of the plurality of papers so that the auxiliary pickup roller is raised up.
25. The apparatus according to claim 21, wherein the auxiliary pickup roller is rotatably installed to an axis of the main pick up roller.

26. The apparatus according to claim 21, wherein the separating guide has a predetermined dam-type slope.

27. The apparatus according to claim 26, wherein the separating guide further comprises:

a plurality of friction members attached to a surface portion of the separating guide.

28. The apparatus according to claim 21, further comprising:

a pickup arm to support the main pickup roller.

29. The apparatus according to claim 28, wherein the auxiliary pickup roller is installed between the main pick up roller and the separating guide through the pickup arm.

30. The apparatus according to claim 21, further comprising:

a power transferring unit to provide power to the main pickup roller.

31. The apparatus according to claim 29, further comprising:

at least two supporting plates to support the auxiliary pickup roller between the main pickup roller and the separating guide.

32. The apparatus according to claim 31, wherein the at least two supporting plates comprise:

a first connecting part rotatably connected to a rotational axis of the main pickup roller;  
and

a second connecting part to which the auxiliary pickup roller is rotatably installed.

33. The apparatus according to claim 32, further comprising:

an elastic member having a torsion spring with one end connected to the rotational axis of the main pickup roller and another end connected to the at least two supporting plates, to provide pressure to the plurality of papers.

34. The apparatus according to claim 30, wherein the exciting unit further comprises:

a pair of exciting units provided at each end of the power transferring unit.

35. The apparatus according to claim 17, wherein the auxiliary pickup roller is provided within a predetermined distance from the separating guide.

36. The apparatus according to claim 21, wherein operational force applied to the main pickup roller is constant.

37. The apparatus according to claim 21, wherein the auxiliary pickup roller further comprises:

a plurality of auxiliary pickup rollers.

38. The apparatus according to claim 37, wherein a contact area between the plurality of auxiliary pickup rollers and each of the plurality of papers is reduced, and pressure application force per unit area increases.

39. The apparatus according to claim 21, wherein the auxiliary pickup roller is merely rotated by frictional force created when each of the plurality of papers picked up by rotation of the main pickup roller passes through the auxiliary pickup roller.